REMARKS

Allowable Subject Matter

Applicants gratefully acknowledge the Examiner's indication that claims 1-3 and 5-11 recite allowable subject matter.

Amendments

Claims 1-11 are amended above to use language in accordance with conventional US practice. These amendments do not narrow the scope of the claims.

Claim 3 is amend to delete "obtained by atmospheric distillation of a crude petroleum and whose starting and end points of distillation are encompassed between 80 and 180°C." These features are recited in new claims 12 and 13. See, e.g., page 3, lines 16-19, and page 13, lines 11-14. Claim 6 is amended to delete "by a vapor-phase process, a liquid-phase process or a mixed gaseous/liquid phase process." These features are recited in new claims 14-16. See, e.g., page 4, lines 1-6.

New claims 17-31 are directed to further aspects of the invention and are supported throughout the disclosure. See, e.g., the original claims, page 4, lines 11-20, and page 8, lines 6-10.

Rejection of Claim 11 under 35 USC 112, first paragraph

Claim 11 is rejected under 35 USC 112, first paragraph, on grounds of alleged lack of written description. This rejection is respectfully traversed.

The rejection is based on the replacement of the term "vaporeforming" by the "steam reforming." The rejection asserts that "steam reforming" constitutes new matter. Applicants' disagree.

While "vaporeforming" is the literal English translation of the French term "vaporeformage" (see, e.g., claim 11 of the priority document), the actual English term is steam reforming. See, e.g., the attached front pages of WO 2004/024324 and WO 03/086964, both of which have the English term "steam reforming" in their titles. Compare the print outs from

Delphion showing the French titles of these applications, both of which use the term "vaporeformage."

In view of the above remarks, withdrawal of the rejection is respectfully requested.

Rejection of Claim 4 under 35 USC 112, second paragraph

Claim 4 is amended above to recite that the substrate is selected from silica and alumina. This language constitutes proper Markush format. Withdrawal of the rejection is respectfully requested.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,

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Attorney Docket No.: PET-2104

Date: February 16, 2006

FEB 1 7 2006
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(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum
Internationales Büro

(43) Internationales Veröffentlichungsdatum
25. März 2004 (25.03.2004)

PCT

(10) Internationale Veröffentlichungsnummer
WO 2004/024324 A1

(51) Internationale Patentklassifikation⁷: **B01J 37/02**, 23/40, 23/46, C01B 3/38, 3/40, H01M 8/06

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02019014.6 26. August 2002 (26.08.2002) EP

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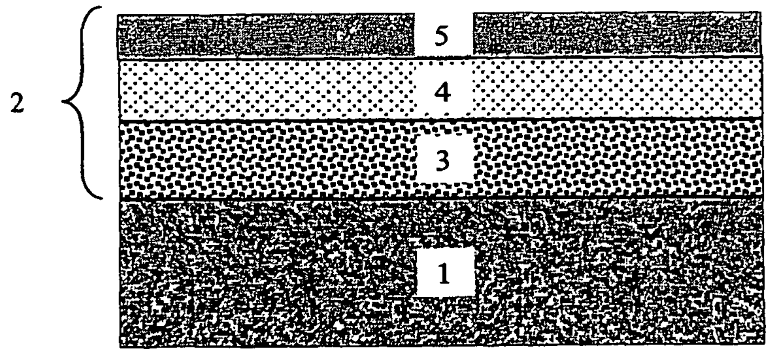
(81) Bestimmungsstaaten *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR,

[Fortsetzung auf der nächsten Seite]

(54) Title: MULTI-LAYER CATALYST FOR THE AUTOTHERMAL STEAM REFORMING OF HYDROCARBONS AND A METHOD FOR USING SAID CATALYST

(54) Bezeichnung: MEHRSCHICHTIGER KATALYSATOR ZUR AUTOTHERMEN DAMPFREFORMIERUNG VON KOHLENWASSERSTOFFEN UND VERFAHREN ZU SEINER VERWENDUNG



(57) Abstract: The invention relates to a catalyst, in addition to a method for the autothermal catalytic steam reforming of hydrocarbons using said catalyst. The catalyst has a multi-layer structure, containing a lower catalyst layer lying directly on a support body and an upper catalyst layer lying on said lower layer. Preferably, the lower catalyst layer catalyses the partial oxidation process and the upper catalyst layer the steam reforming process. An additional embodiment discloses a triple-layer catalyst, which has an additional catalyst layer for carbon-monoxide conversion. Each catalyst layer contains at least one metal from the platinum group on an oxidic support material. The steam reforming method is achieved in an adiabatic process by guiding an educt mixture consisting of hydrocarbons, oxygen and water or water vapour that has been heated to preheating temperature over the multi-layer catalyst. Said catalyst and method can be used to generate combustible gases containing hydrogen in reformer systems, preferably for fuel cells.

(57) Zusammenfassung: Die Erfindung betrifft einen Katalysator sowie ein Verfahren zur autothermen, katalytischen Dampfreformierung von Kohlenwasserstoffen unter Verwendung des Katalysators. Der Katalysator besitzt einen mehrschichtigen Aufbau und enthält eine untere, direkt auf einem Tragkörper liegende Katalysatorschicht und eine auf der unteren Katalysatorschicht liegende obere Katalysatorschicht, wobei die untere Katalysatorschicht vorzugsweise die partielle Oxidation und die obere Katalysatorschicht vorzugsweise die Dampfreformierung katalysiert. In einer weiteren Ausführungsform wird ein dreischichtiger Katalysator beschrieben, der eine weitere Katalysatorschicht für die Kohlenmonoxid-Konvertierung aufweist. Jede Katalysatorschicht enthält mindestens ein Platingruppenmetall auf einem oxidischen Trägermaterial. Das Verfahren der Dampfreformierung erfolgt in einem adiabatischen Prozess durch Leiten eines auf eine Vorwärmtemperatur erwärmten Eduktgemisches aus Kohlenwasserstoffen, Sauerstoff und Wasser bzw. Wasserdampf über den mehrschichtigen Katalysator. Katalysator und Verfahren finden Verwendung zur Erzeugung von wasserstoffhaltigen Brenngasen in Reformersystemen, vorzugsweise für Brennstoffzellen.

WO 2004/024324 A1

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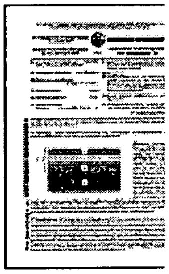
Go to: Derwent
Ema

Title:	**WO04024324A1: CATALYSEUR MULTICOUCHE DESTINE AU VAPOREFORMAGE AUTOTHERME D'HYDROCARBURES ET PROCI D'UTILISATION**[German][English]
Derwent Title:	Catalyst used in the autothermal steam reforming of hydrocarbons in reformers for fuel cell systems comprises a multilayered catalyst composition consisting of a lower layer [Derwent Record]
Country:	**WO** World Intellectual Property Organization (WIPO)
Kind:	**A1** Publ.of the Int.Appl. with Int.search report
Inventor:	**WIELAND, Stefan**; Starkenburgring 27, 63069 Offenbach, Germany **BAUMANN, Frank**; Taunusstrasse 6, 63755 Alzenau, Germany **DUISBERG, Matthias**; Rückertstrasse 38, 60314 Frankfurt, Germany
Assignee:	**UMICORE AG & CO. KG**, Rodenbacher Chaussee 4, 63457 Hanau, Germany News, Profiles, Stocks and More about this company
Published / Filed:	**2004-03-25** / 2003-08-26
Application Number:	**WO2003EP0009449**
IPC Code:	IPC-7: **B01J 37/02**; B01J 23/40; B01J 23/46; C01B 3/38; C01B 3/40; H01M 8/06;
ECLA Code:	**B01J23/40**; B01J23/46D; B01J37/02M4; C01B3/38A; C01B3/40; H01M8/06B2;
Priority Number:	2002-08-26 **EP2002000019014**



Abstract:

L'invention concerne un catalyseur et un procédé de vaporeformage catalytique autotherme d'hydrocarbures faisant intervenir ledit catalyseur. Ledit catalyseur présente une structure multicouche et contient une couche catalytique inférieure située directement sur un corps support, ainsi qu'une couche catalytique supérieure située sur la couche catalytique inférieure, ladite couche catalytique inférieure catalysant de préférence l'oxydation partielle, et la couche catalytique supérieure catalysant de préférence le vaporeformage. Dans un autre mode de réalisation, l'invention concerne un catalyseur à trois couches, comportant une couche catalytique supplémentaire destinée à la conversion de monoxyde de carbone. Chaque couche catalytique contient au moins un métal du groupe platine sur un matériau support d'oxydation. Le procédé de vaporeformage est effectué dans un processus adiabatique par passage d'un mélange d'éduit composé d'hydrocarbures, d'oxygène, d'eau ou de vapeur d'eau, chauffé à une température de préchauffage, sur le catalyseur multicouche. Le catalyseur et le procédé selon l'invention peuvent être employés pour la production

	de gaz combustibles contenant de l'hydrogène dans des systèmes de reformage, de préférence dans des piles à combustible. [German] [English]
Attorney, Agent or Firm:	**VOSSIUS & PARTNER** ; Siebertstr. 4, 81765 München Germany
INPADOC Legal Status:	Show legal status actions **Buy Now:** Family Legal Status Report
Designated Country:	AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NI NO NZ OM PG PH PL PT RO RU SC SD SE SG SK SL SY TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW, **European patent:** AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PT RO SE SI SK TR, **OAPI patent:** BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG, **ARIPO patent:** GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW, **Eurasian patent:** AM AZ BY KG KZ MD RU TJ TM
Family:	Show 7 known family members
First Claim: Show all claims	Patentansprüche
Description Expand description	± **Mehrschichtiger Katalysator zur autothermen Dampfreformierung von Kohlenwasserstoffen und Verfahren zu seiner Verwendung** Die Erfindung betrifft einen mehrschichtigen Katalysator zur Erzeugung von Wasser-
Other Abstract Info:	None

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International Bureau

(43) International Publication Date
23 October 2003 (23.10.2003)

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(10) International Publication Number
WO 03/086964 A1

(51) International Patent Classification⁷: C01B 3/26

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(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/372,258 12 April 2002 (12.04.2002) US
10/407,500 4 April 2003 (04.04.2003) US

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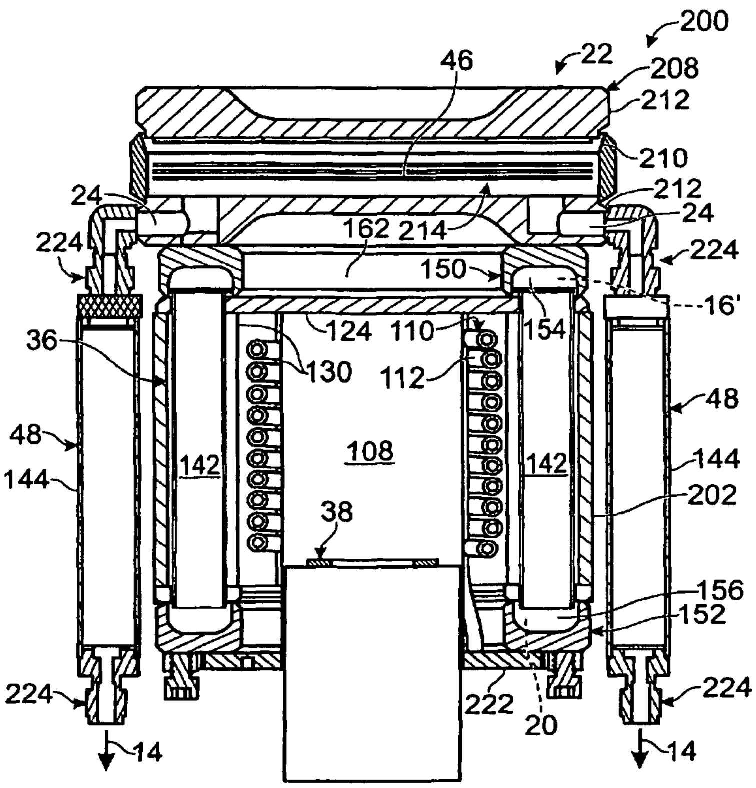
(81) Designated States *(national)*: AE, AG, AL, AM, AT (utility model), AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN (utility model), CO, CR, CU, CZ (utility model), CZ, DE (utility model), DE, DK (utility model), DK, DM, DZ, EE (utility model), EE, ES, FI (utility model), FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP (utility model), KE, KG, KP, KR (utility model), KZ, LC, LK, LR,

[Continued on next page]

(54) Title: STEAM REFORMING FUEL PROCESSOR



(57) Abstract: A steam reformer (200) includes a hydrogen producing region (36), in which a mixed gas stream (20) containing hydrogen gas and other gases is produced from vaporized water and a carbon containing feedstock (16'). The steam reformer further includes a separation region (22), in which the mixed gas stream (20) is separated into a hydrogen-rich stream (24) and a byproduct stream (26) and a polishing region (48), in which the hydrogen-rich stream is further purified and hydrogen product stream (14) is produced. In some embodiments, the steam reformer(200) is a vertically oriented fuel processor including an external metal or sealed ceramic shell, and the separation region (22) includes at least one hydrogen-selective membrane (46).

WO 03/086964 A1

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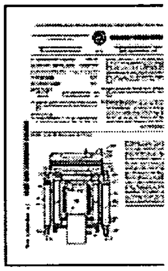
Title: WO03086964A1: DISPOSITIF DE TRANSFORMATION DE COMBUST VAPOREFORMAGE[English]

Derwent Title: Steam reforming fuel processor comprises hydrogen-producing region in which mixed gas stream is produced and separation region in which mixed gas stream is separated into hydrogen-rich stream and byproduct stream [Derwent Record]



Country: WO World Intellectual Property Organization (WIPO)

Kind: A1 Publ.of the Int.Appl. with Int.search report

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Assignee: IDATECH, LLC, 63160 Britta Street, Bend, OR 97701, United States of America
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Published / Filed: 2003-10-23 / 2003-04-07

Application Number: WO2003US0010943

IPC Code: IPC-7: C01B 3/26;

ECLA Code: B01B1/00B; B01D53/22; B01J8/00L4; B01J8/06H; C01B3/38B; C01B3/50B;

Priority Number:
2002-04-12 US2002000372258P
2003-04-04 US2003000407500

Abstract: La présente invention a trait à une unité de vaporeformage (200) comportant une zone de production d'hydrogène (36), dans laquelle un mélange de flux gazeux (20) contenant du gaz hydrogène et d'autres gaz est produit à partir d'eau évaporée et une charge carbonée (16'). L'unité de vaporeformage comporte une zone de séparation (22), dans laquelle le mélange de flux gazeux (20) est séparé en un flux riche en hydrogène (24) et une vapeur de sous-produit (26) et une zone de polissage (48), dans laquelle le flux riche en hydrogène est purifié davantage et un flux de produit hydrogéné (14) est produit. Dans certains modes de réalisation,

l'unité de vaporeformage (200) est un dispositif de transformation de combustible orienté verticalement comportant une enveloppe extérieure métallique ou en céramique étanche, et la zone de séparation (22) comprend au moins une membrane sélective de l'hydrogène (46). [English]

Attorney, Agent or Firm:	**D'ASCENZO, David, S.** ; Kolisch Hartwell, P.C., 520 SW Yamhill Street, Suite 200, Portland, OR 97204 United States of America
INPADOC Legal Status:	Show legal status actions **Buy Now:** Family Legal Status Report
Designated Country:	AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CO CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS KE KG KP KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW, AT CN CZ DE DK EE FI JP KR SK (Utility model), **European patent:** AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PT RO SE SI SK TR, **OAPI patent:** BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG, **ARIPO patent:** GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW, **Eurasian patent:** AM AZ BY KG KZ MD RU TJ TM
Family:	Show 5 known family members
First Claim: Show all claims	WE CLAIM:
Description Expand description	+ **STEAM REFORMING FUEL PROCESSOR** Field of the Disclosure + **Background of the Disclosure** Purified hydrogen is used in the manufacture of many products including metals, edible fats and oils, and semiconductors and microelectronics. + **Brief Description of the Drawings** Fig. 1 is a schematic view of a fuel processing system. + **Detailed Description and Best Mode of the Disclosure** A Mel processing system 10 is schematically illustrated in Fig. 1.
Other Abstract Info:	None

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